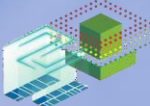


Human-Centric Health-Focused Sustainable **LIVABILITY FOR ALL**


CHINACHEM GROUP
華懋集團

 市區重建局
URBAN RENEWAL
AUTHORITY

 市建局
智建未來
URBAN
REINVENTION
ADVANCE
beyond 20

 **Gammon**

 **RONALD LU
& PARTNERS**

Housing Supply to be Expedited





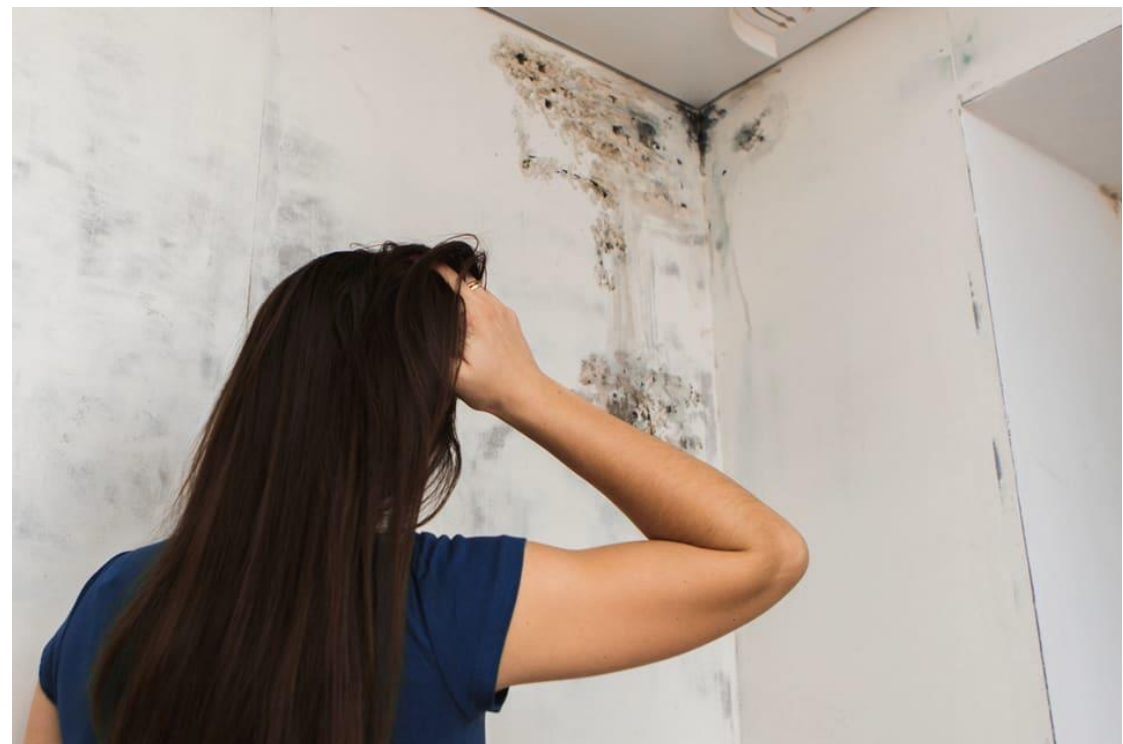
**High Accident
Rate in
Construction**



**Aging
Construction
Workers**



**Extensive
Construction
Waste**



Concerns on Construction Quality



Modular Integrated Construction (MiC)

30% Faster in Construction Speed

70 % Reduction in On-site Labour

75 % Reduction in Construction Noise

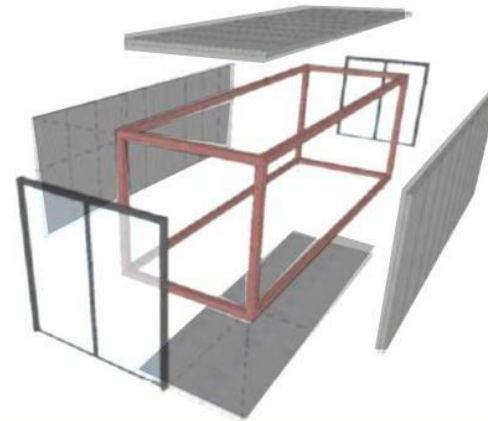
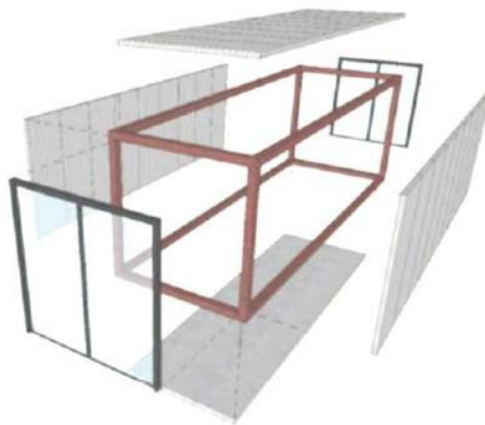
68% Reduction in Construction Waste



Factory Assembly

- Better Quality Control
- Reduce Construction Waste
- Reduce Local Labors
- Progress Not Affected by Weather
- Improve Efficiency
- Improve Safety

3 Types of MiC

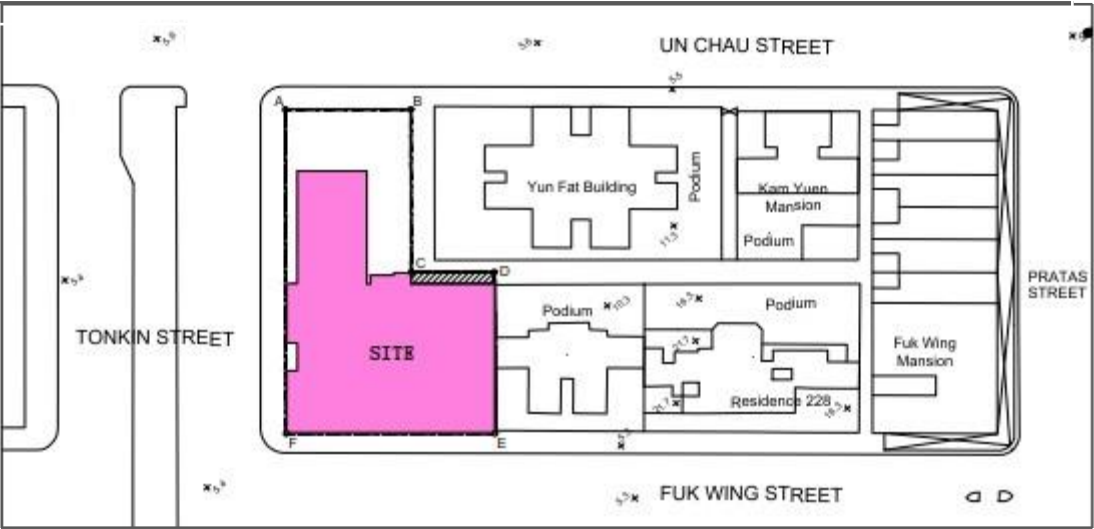


	CONCRETE	STEEL	HYBRID
Structure	All concrete	Steel frame with metal panels	Steel frame with lightweight concrete panels
Weight	20-35 tons	15-20 tons	15-20 tons
Maintenance	Same as traditional	Inspection every 5 years	Inspection every 5 years
Flexibility in Internal Renovation	Same as traditional	Identify pre-determined location for built-in furniture	Same as traditional

PROJECT INFORMATION

SITE AREA	1075 m ²
NO. OF STOREY	6-storey podium & 22-storey tower
GFA	Non-domestic - 1613 m ² ; Domestic - 8062 m ²
NO. OF UNITS PER FLOOR	9 nos. (6 one-bedroom, 2 two-bedroom, 1 three-bedroom)
TARGET OP DATE	2024

SITE LOCATION

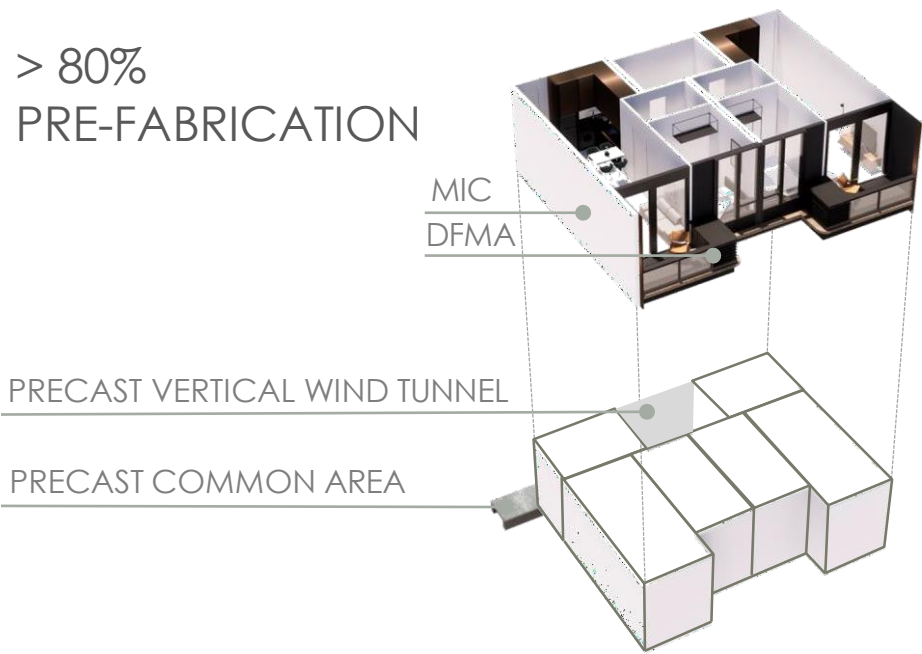


FULL DIGITALISATION FROM DESIGN TO BUILD: BIM 360+MiC

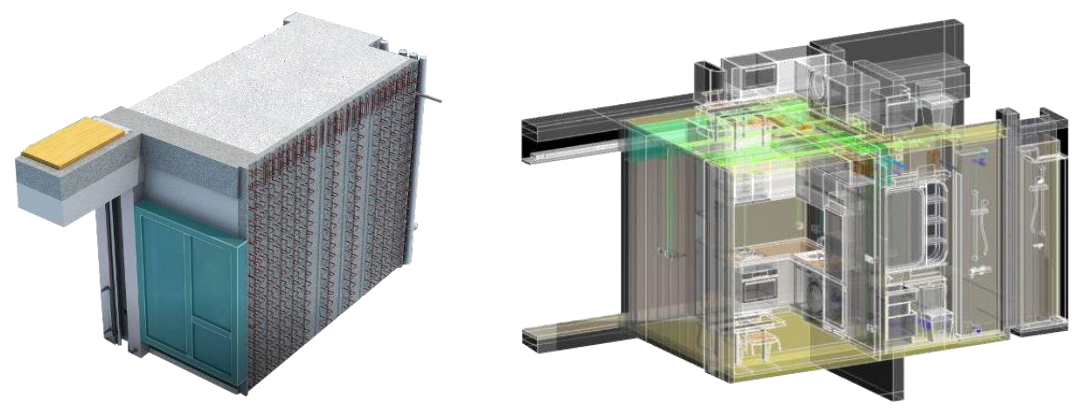


① MAXIMISE ACCURACY

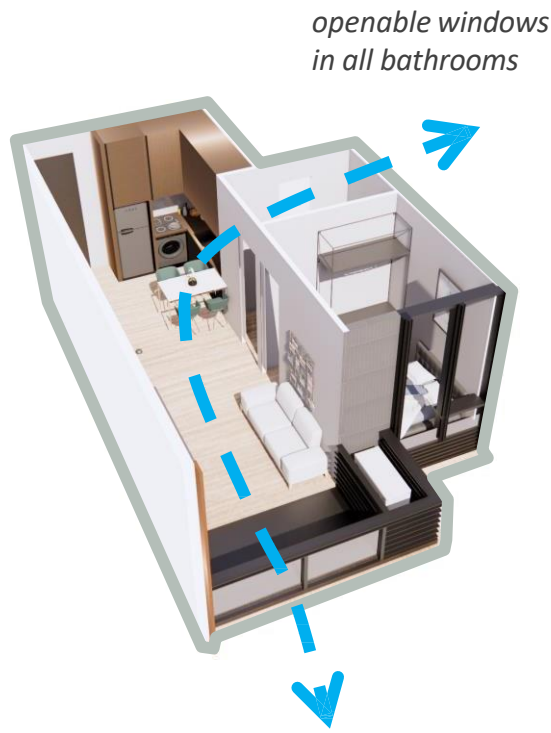
> 80%
PRE-FABRICATION



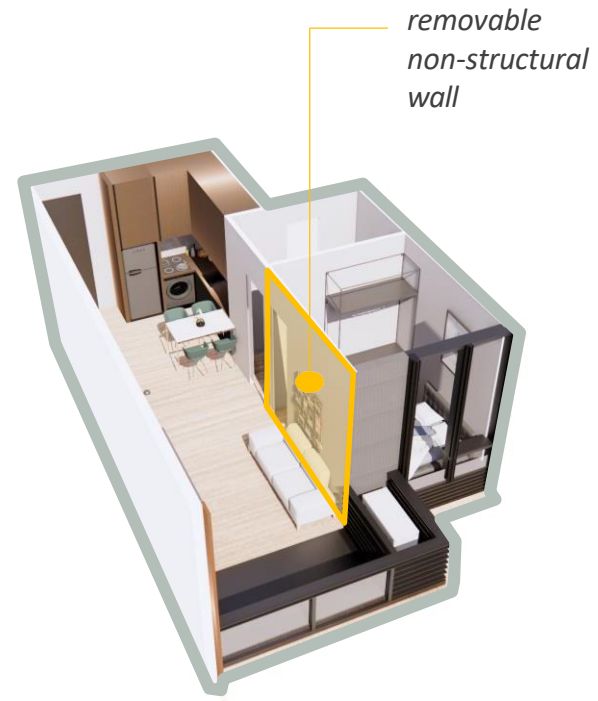
② IMPROVED EFFICIENCY



HUMAN-CENTRIC HEALTH-FOCUSED LOW CARBON LIFESTYLE



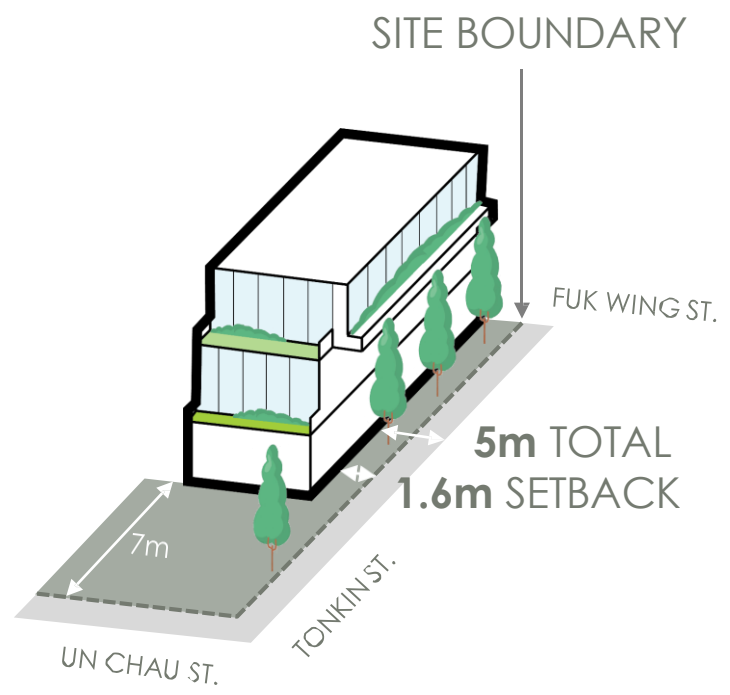
① CROSS VENTILATION
FOR FRESH AIR



② FLEXIBILITY FOR
PERSONALISATION



③ CONNECTION
WITH NATURE



MiC DESIGN & BUILD

22 STOREYS FROM
TRANSFER PLATE ABOVE
(F-to-F HEIGHT: 3260mm)



BUILDING TOTAL HEIGHT : 104.310m

G/F – 6/F : in-situ RC structure
(under separate submission)

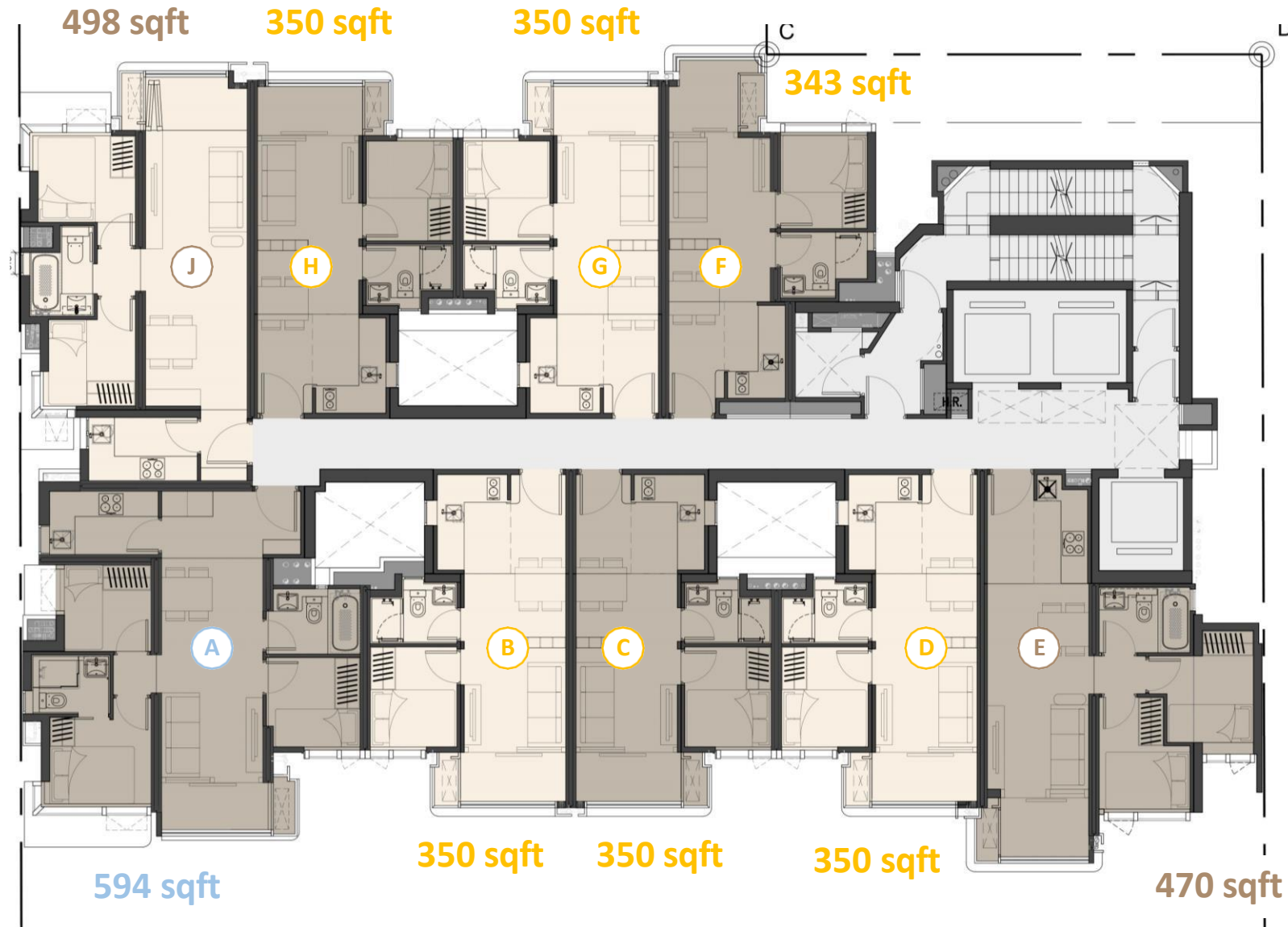
TP : Transfer Plate
(under separate submission)

7/F to 31/F : MiC unit + In-situ RC structure
(typical floor)

R/F : MiC + In-situ RC structure
(one floor only)

ABOVE R/F : In-situ RC structure

MiC – TYPICAL LAYOUT & FLAT MIX

1 BEDROOM UNIT **x6**2 BEDROOM UNIT **x2**3-BEDROOM UNIT **x1****WHOLE UNIT BY MiC****INCLUDING FOLLOWING FEATURES :**

1. BALCONY
2. CURTAIN WALL
3. UTILITY PLATFORM
4. AC PLATFORM

NO SUNKEN SLAB

(PER TYPICAL FLOOR)

GFA : (FLAT) 286 sqm**(CORE) 76 sqm**

MiC - MODULE LAYOUT

33 MODULES /FLOOR

24 MODULE TYPES /FLOOR



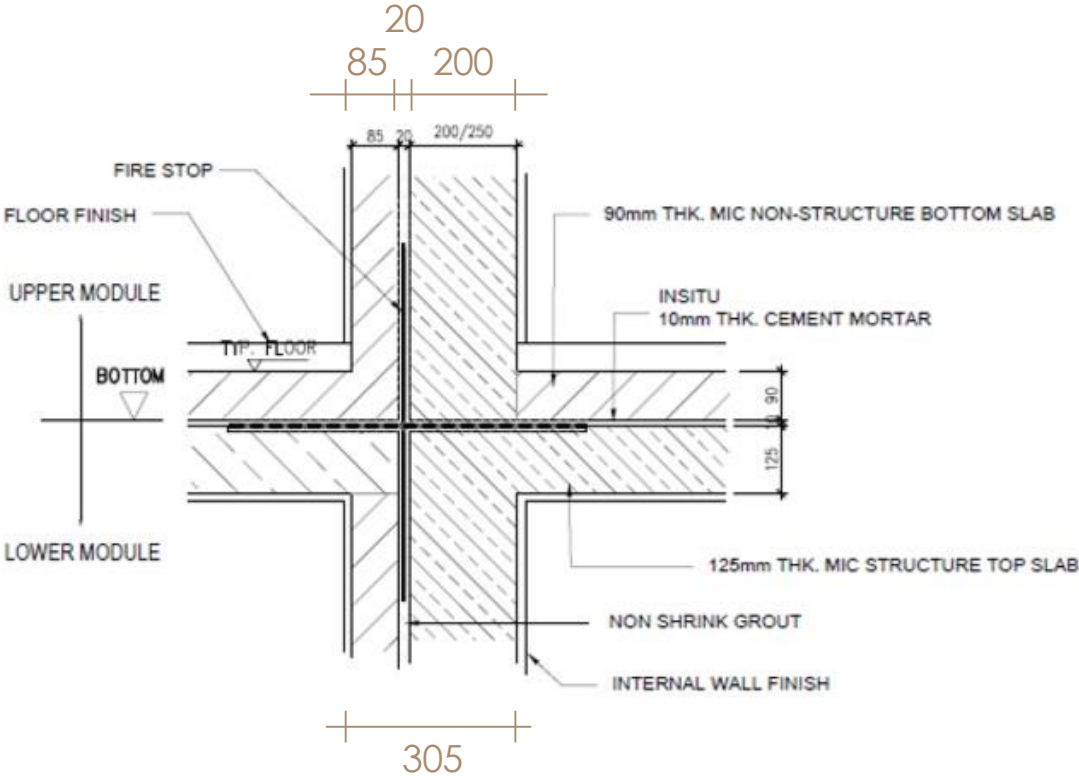
— : non-structural wall possible for future modification

STANDARDISATION OF CONSTRUCTION

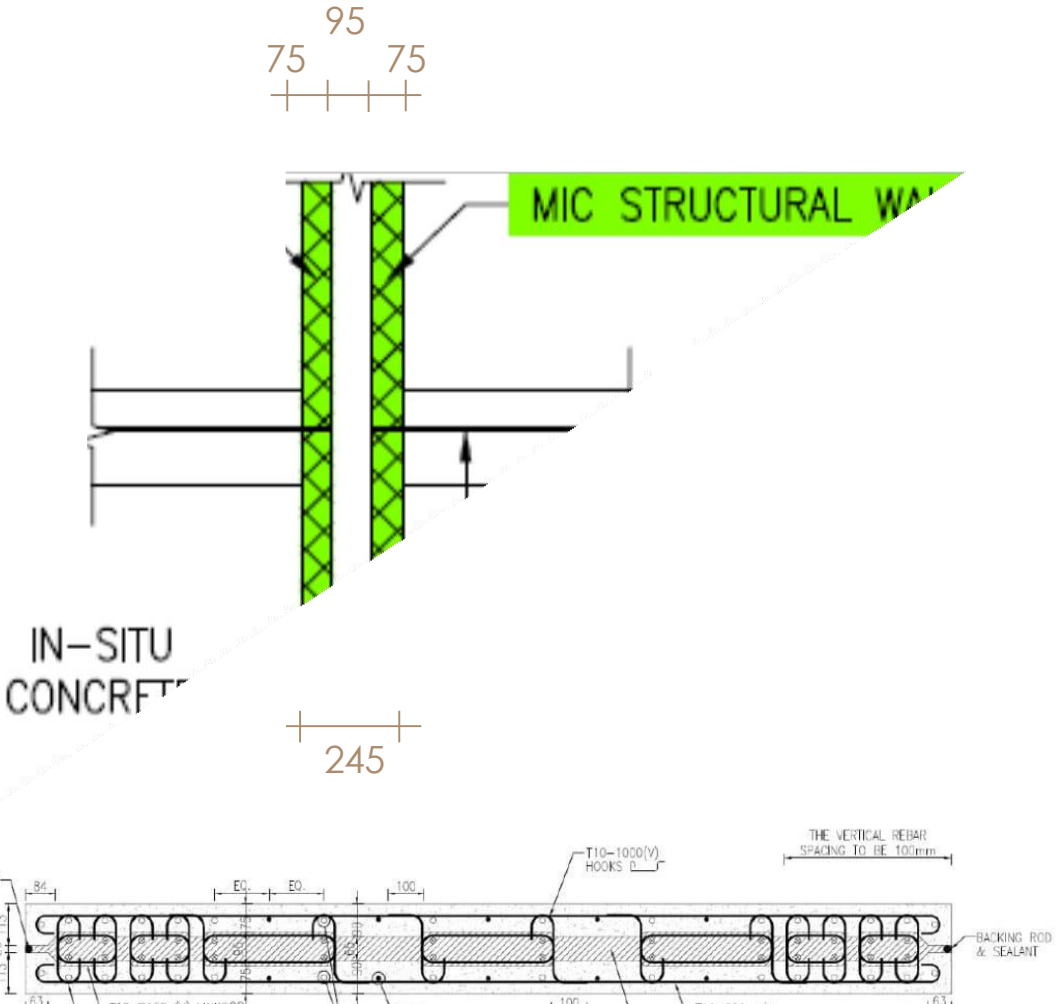
1. *>80% pre-fabrication works, reduced dust, noise and waste water on-site*
2. *Reduced waste disposal and better on-site house keeping*
3. *Improved safety of workers due to standardised and well-planned works*

MiC MODULARISATION OF TYPICAL FLOOR

CONVENTIONAL SYSTEM



COMPOSITE WALL SYSTEM



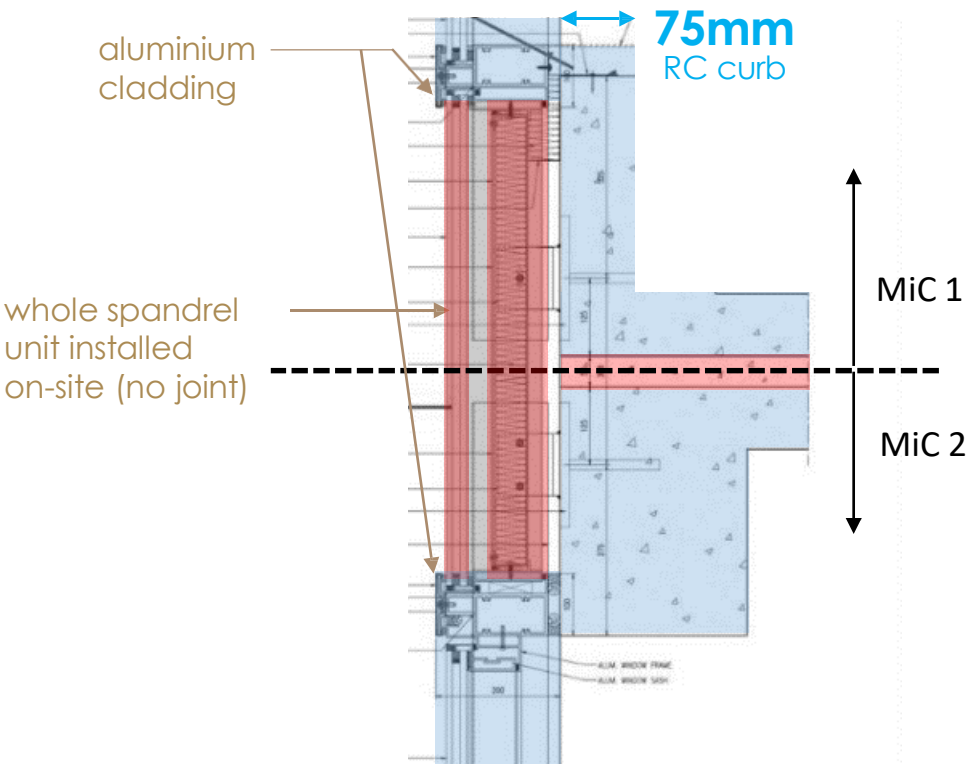
MiC FACADE

view from Fuk Wing Street



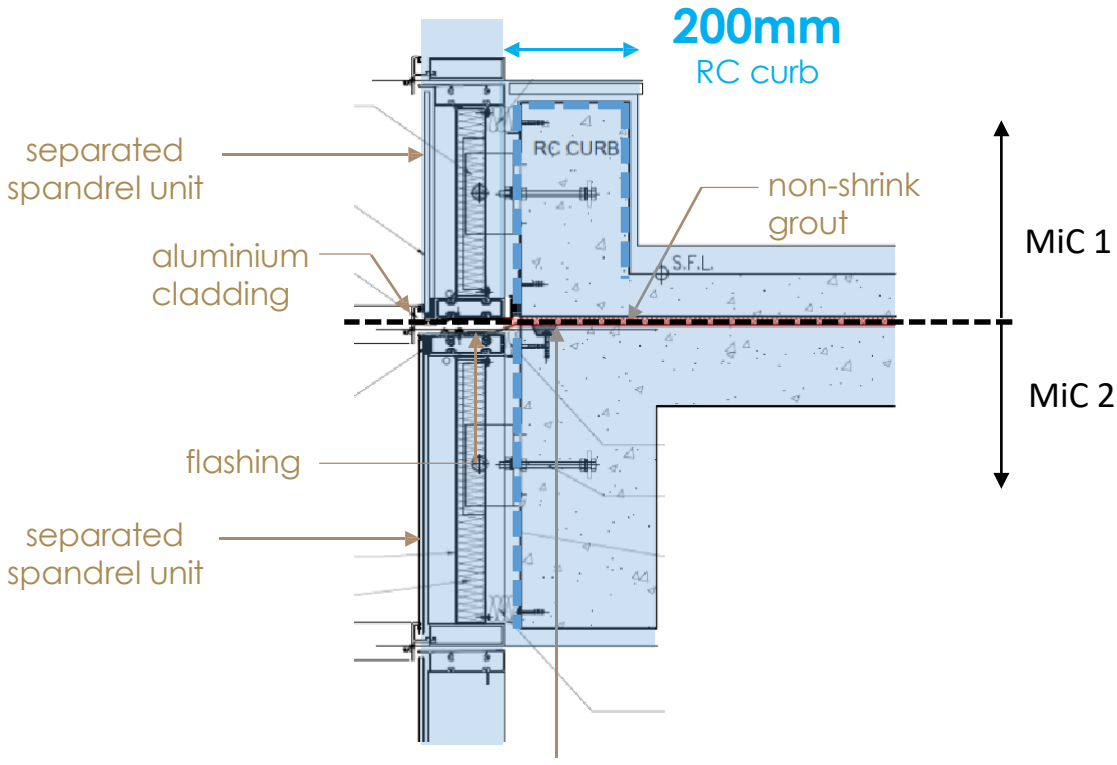
| CURTAIN WALL CONNECTION DETAILS – ON-SITE/OFF-SITE

CURRENT DESIGN



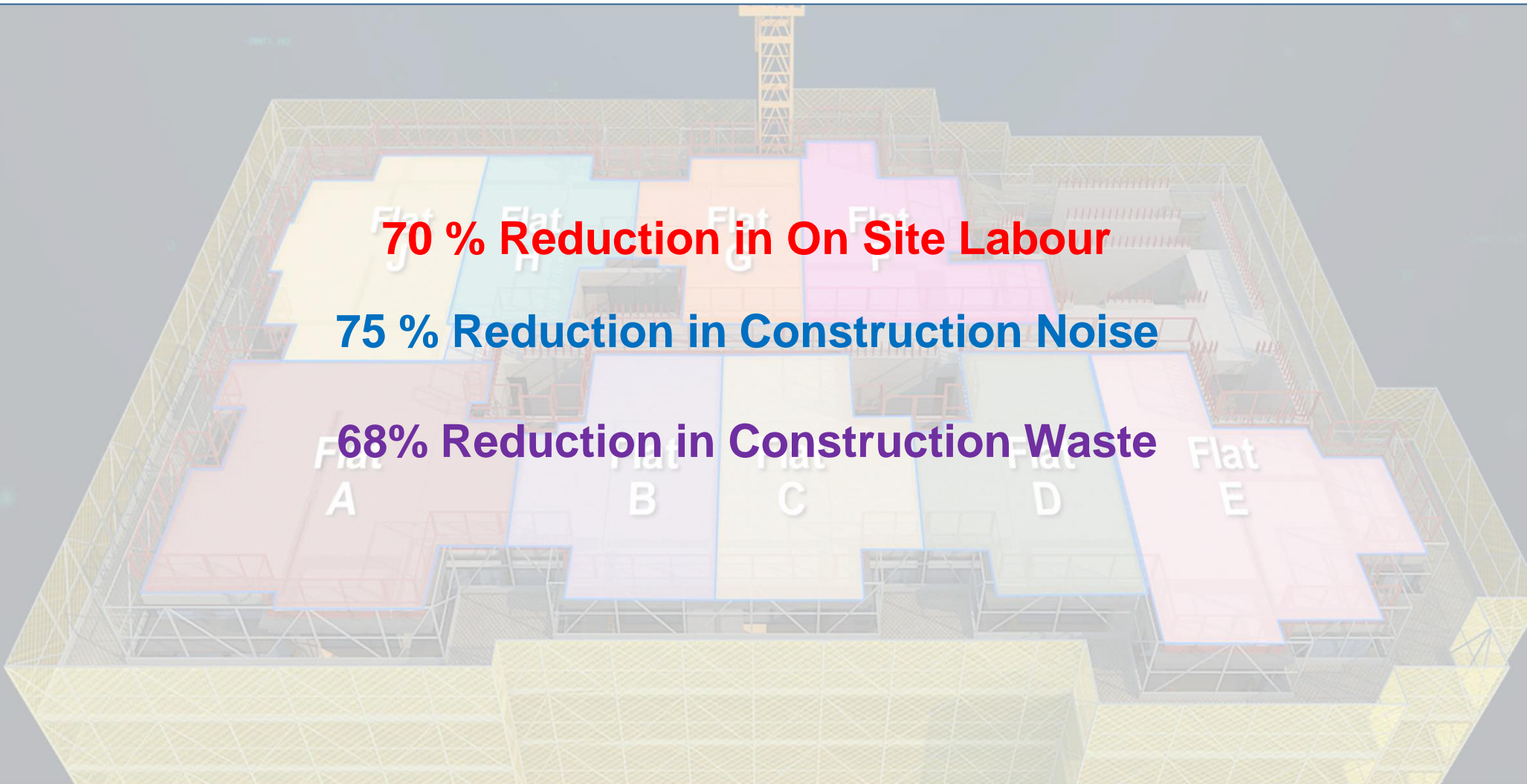
SPANDREL TO BE INSTALLED ON-SITE

ALTERNATIVE

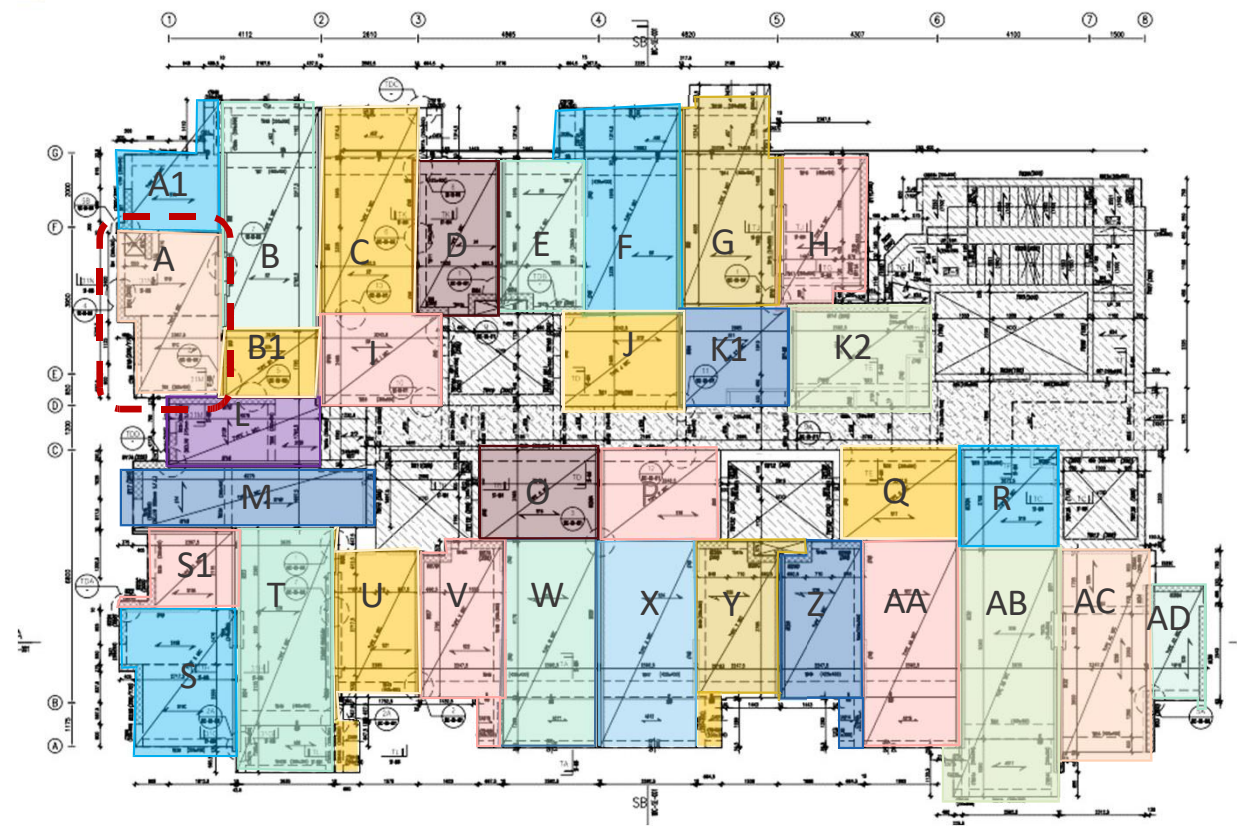


SPANDREL TO BE INSTALLED OFF-SITE

Both methods of curtain wall connection are **considered for GFA exemptions**.
Similar to conventional projects, exemptions will be counted from the external wall of the building (i.e. outer edge of 300mm curb).



MiC Type Summary



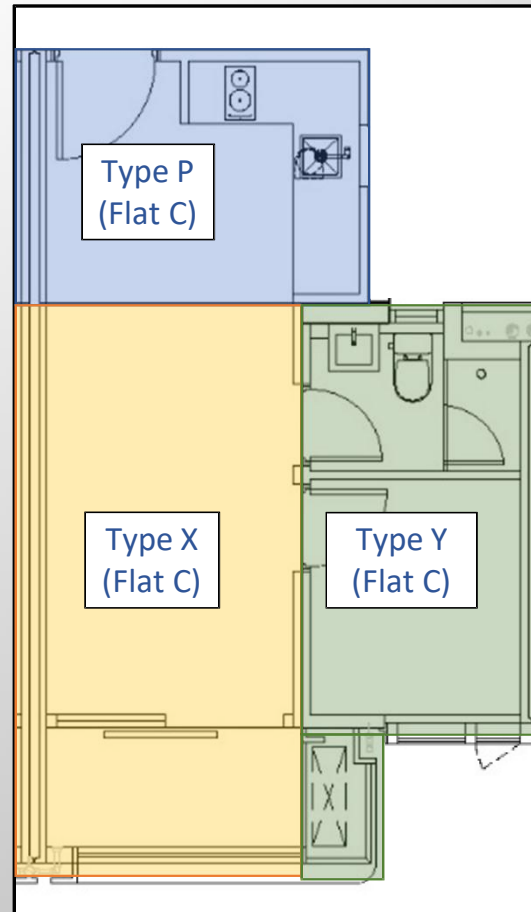
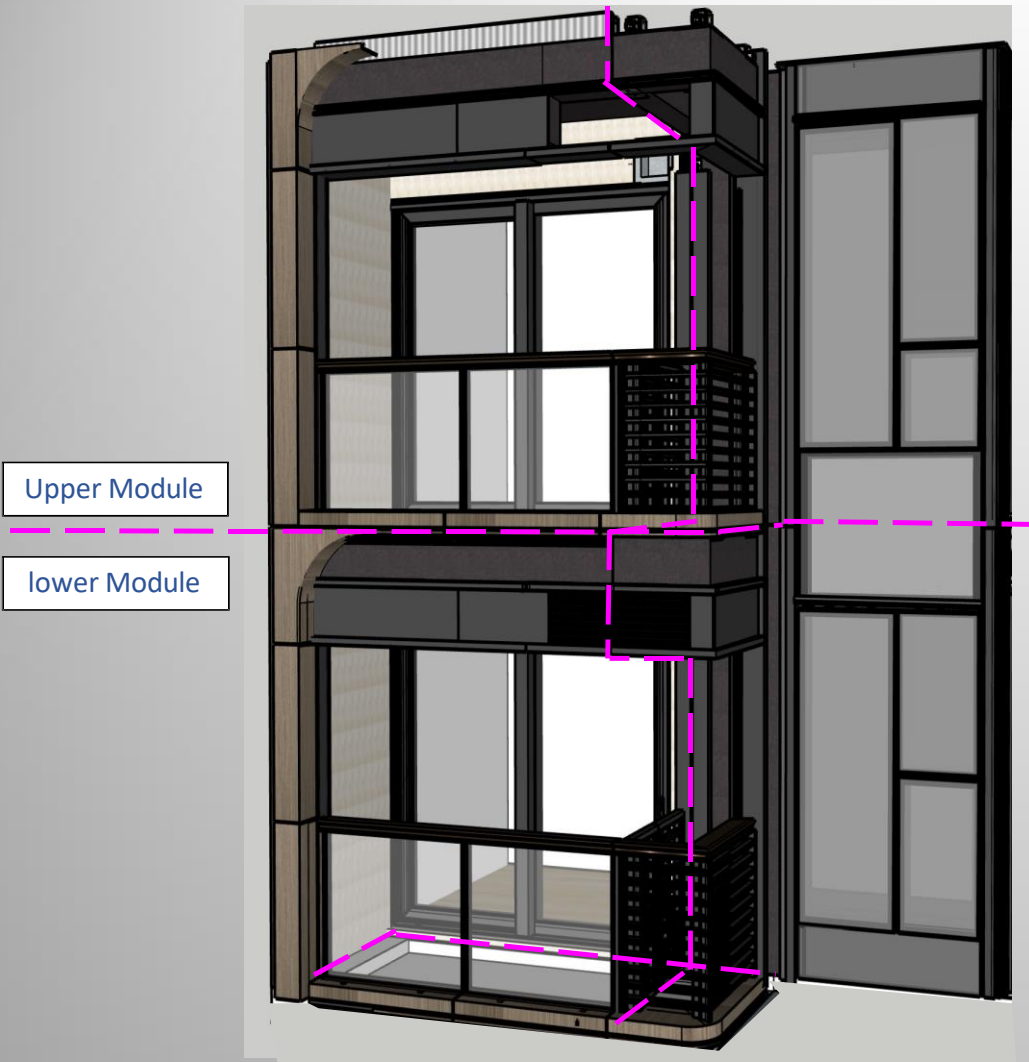
MiC Floor	No. of type	No. of MiC	Level	Total
Typical Floor	33	33	21	693

 The heaviest MiC type is **A** with 25tons
(5.38mL x 2.82mW x 3.24mH)

Module	Width(m)	Length (m)	Height(m)	Total Weight (Ton)
A1	2.84	4.21	3.24	11.1
A	2.82	5.38	3.24	24.7
B	2.64	6.21	3.24	19.2
B1	2.64	2.01	3.24	6.6
C,F,AA,X,W	2.59	5.53	3.24	17.6
D,E,Y,Z,V	2.25	5.53	3.24	20.4
G	2.64	5.86	3.24	15.8
H	2.37	4.23	3.24	19.2
I	2.47	3.24	3.24	16.6
J,Q,O,P	2.47	3.24	3.24	15.7
K1	2.76	2.99	3.24	13.4
K2	2.76	3.69	3.24	22.1
L	1.79	4.08	3.24	17.3
M	1.84	6.28	3.24	21.3
S1	2.28	3.15	3.24	9.1
S	3.15	4.63	3.24	20.9
T	2.64	6.57	3.24	21.0
U	2.29	6.57	3.24	17.7
R	2.57	2.70	3.24	13.5
AB	2.82	6.61	3.24	21.3
AC	2.44	6.16	3.24	22.2
AD	1.61	4.48	3.24	8.9

Max	3.15	6.61	3.24	24.7
-----	------	------	------	------

MiC Arrangement per Flat

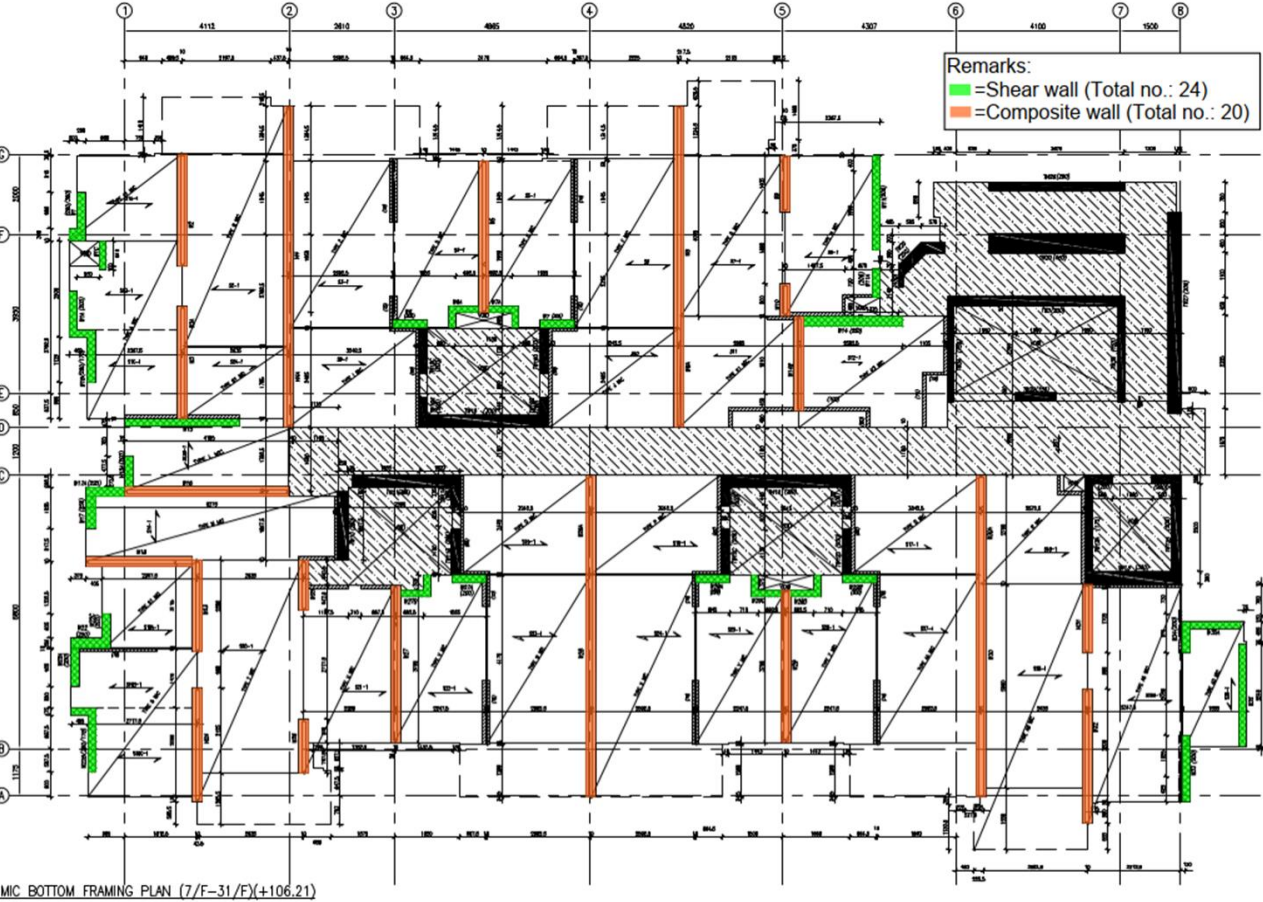


Plan view

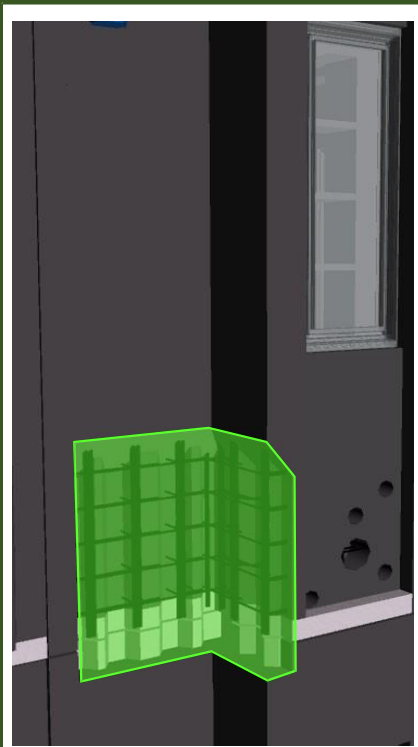


MiC Connection Details

Structural On Site Connection



Wall Connection



Shear Wall
(24 nos / Floor)



Composite Wall
(20 nos / Floor)

MiC Composite Wall Connection Construction Sequence

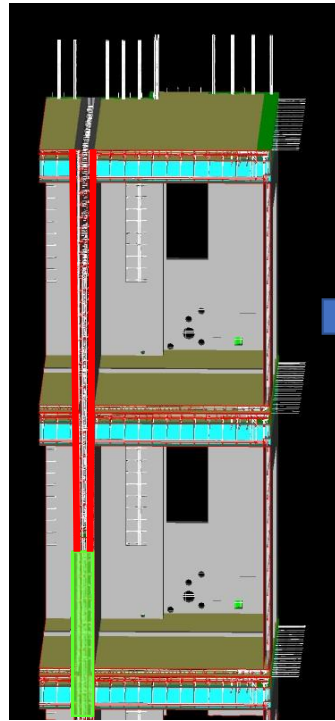


Composite Wall
(20 nos / Floor)



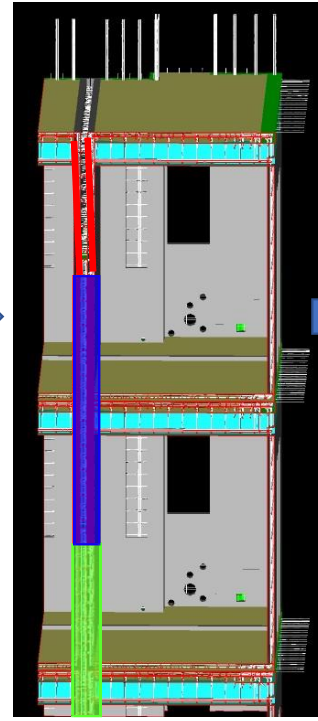
STEP 1

1. Complete the concrete works of lower modules
2. Place the left module



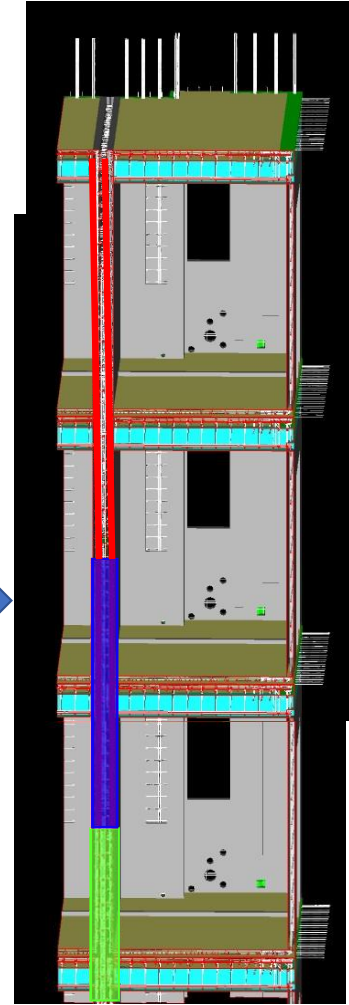
STEP 2

1. Place the right module
2. Insert the in-situ lapping rebar



STEP 3

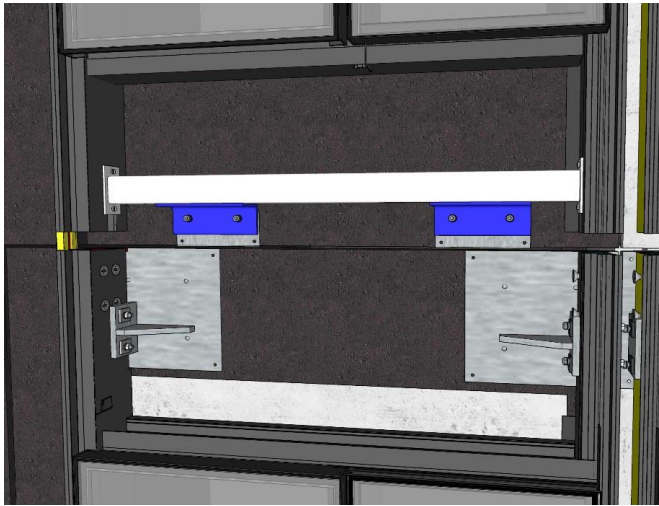
1. Do in-situ concreting for connecting the lower modules



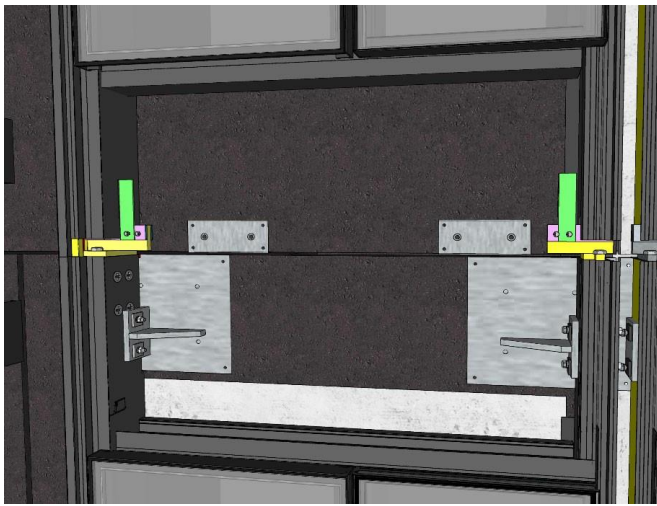
STEP 4

1. Place the upper modules
2. Insert the in-situ lapping rebar

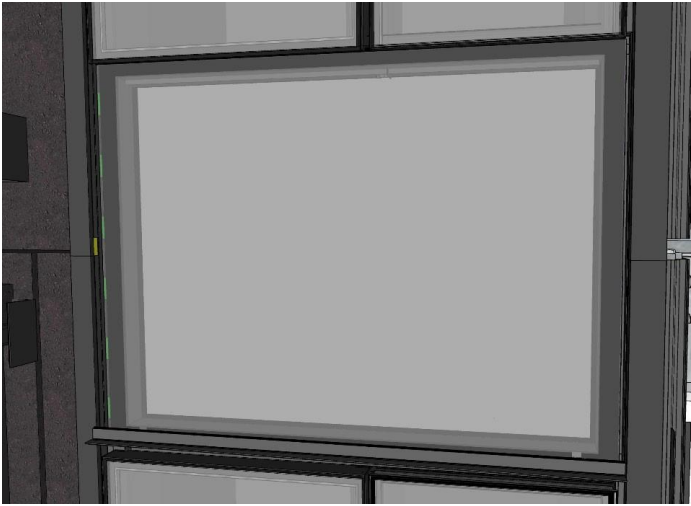
Façade On Site Connection



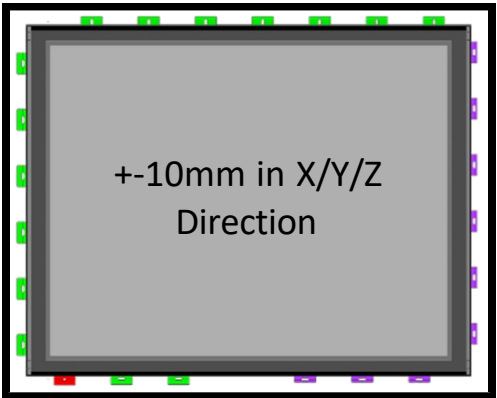
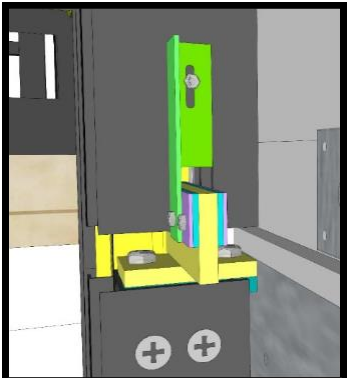
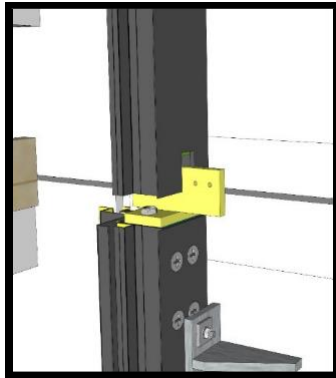
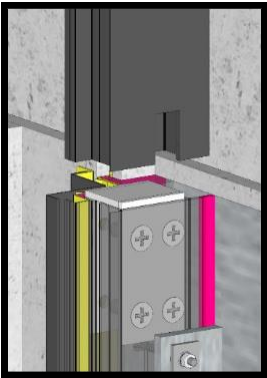
1. Curtain Wall Delivery with MiC Unit



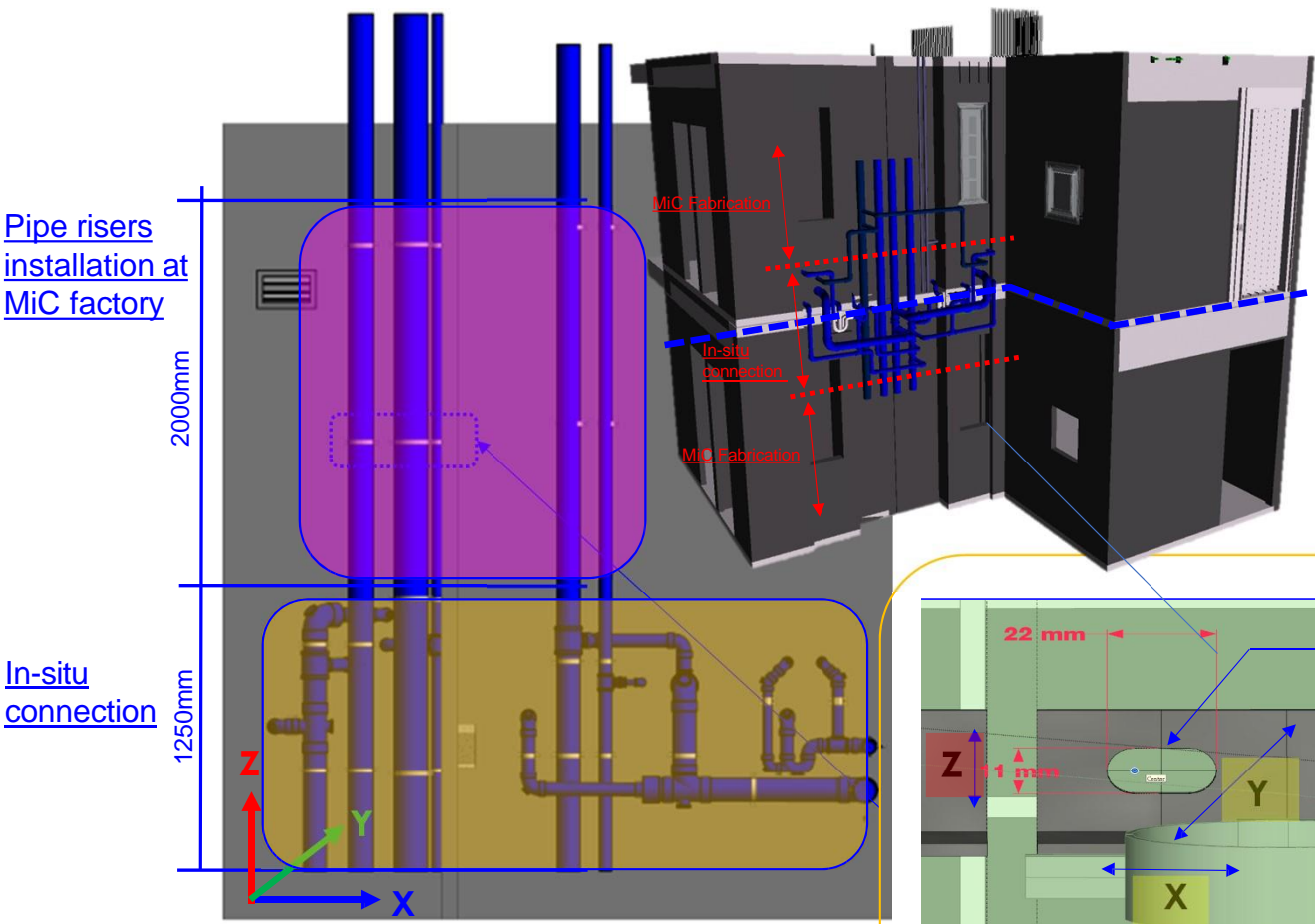
2. Curtain Wall Connection Sleeve Installation



3. Spandrel Glass Installation



Tolerance Allowable (Type 8 Details: External PD Pipe Risers)



Type 8 – PD Pipe Riser Connection



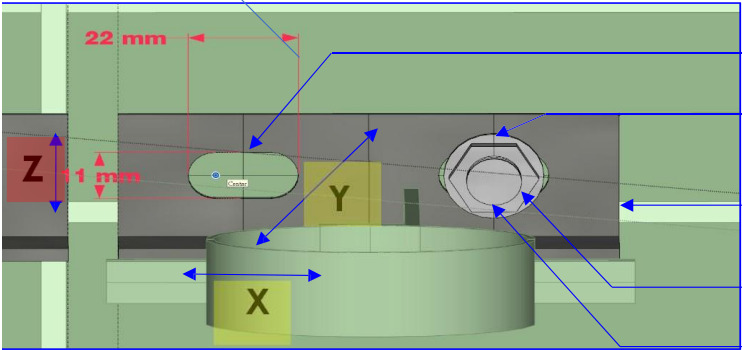
Expansion Socket
(for PVC pipe)



Coupling Joint
(For C.I. pipe)

Tolerance Allowable (PD Pipe)

- X/Y: +/- 10 mm
(Tolerance absorbed by Pipe Bracket)
- Z: Not Applicable
(in-situ measurement & installation)



Pipe riser bracket Design

- Slot hole
- Dia.20mm washer
- S.S. angle hanger support
- Lock nut
- M8 anchor bolt

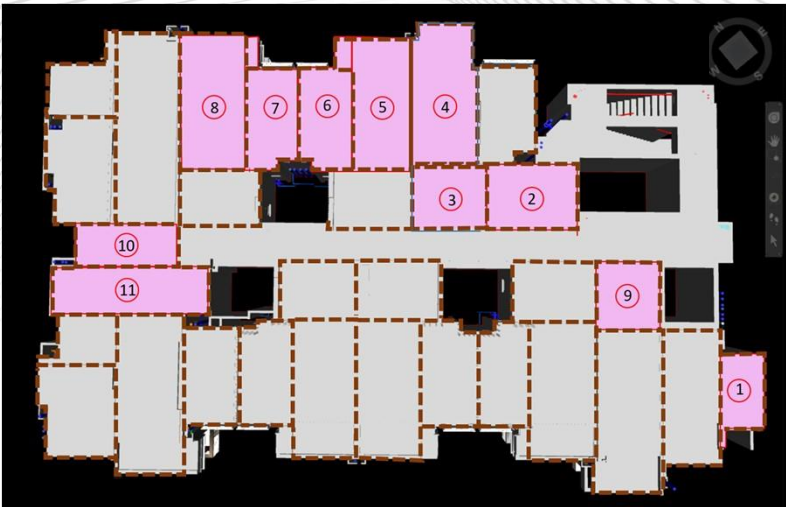


Construction Cycle

4 Day Cycle

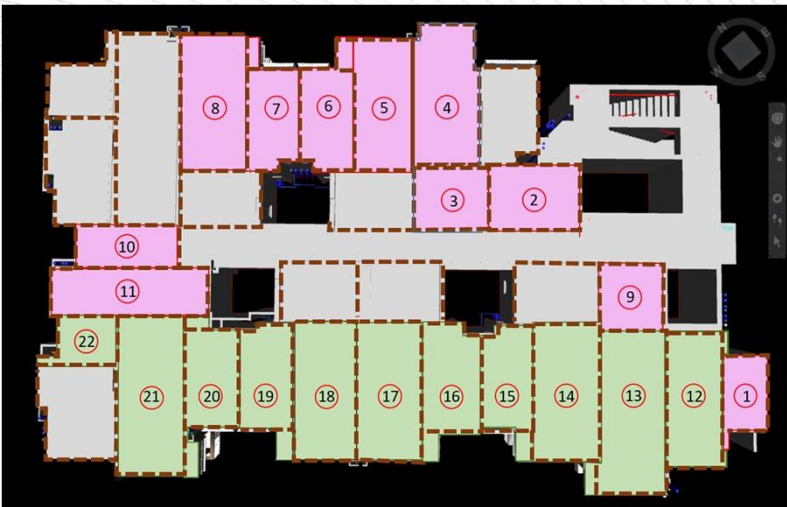
DAY 1

Installed
11 nos. of
MIC



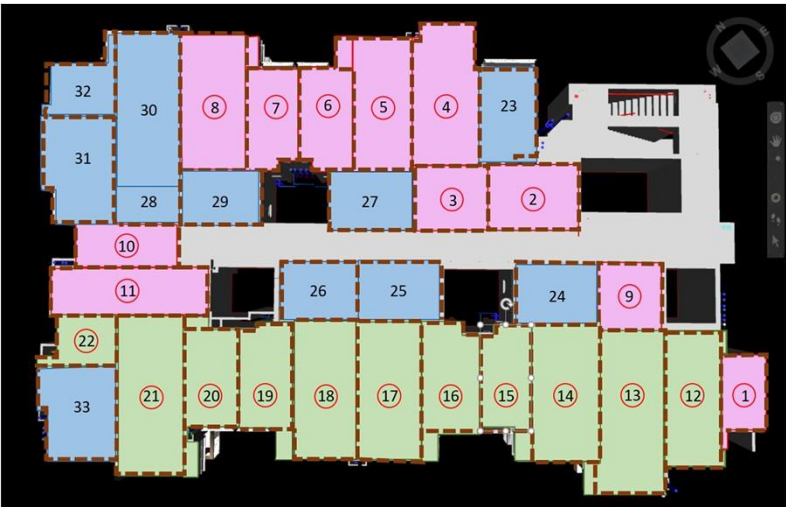
DAY 2

Installed
11 nos. of
MIC



DAY 3

Installed
11 nos. of
MIC



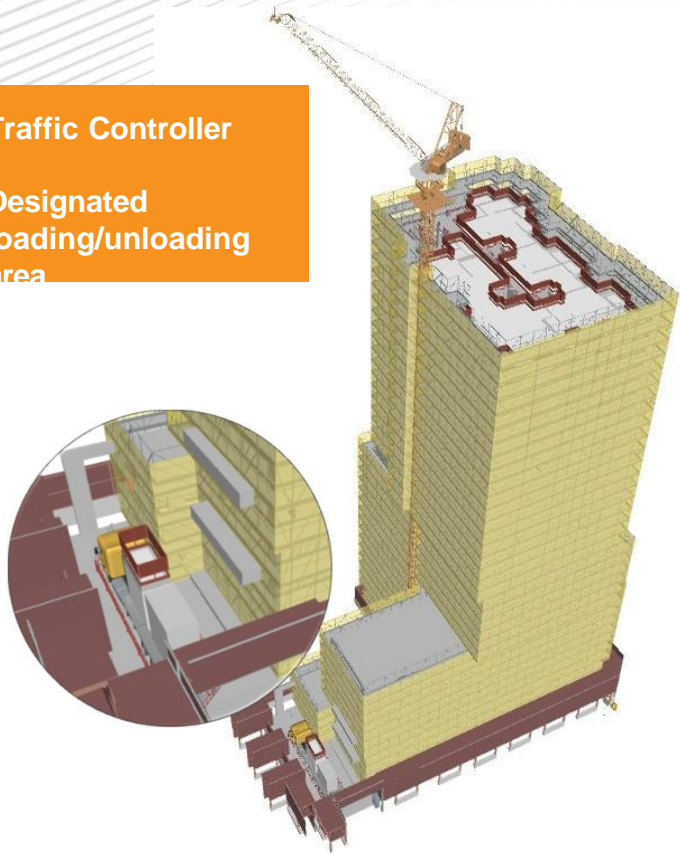
DAY 4

Concreting



Lifting of MiC

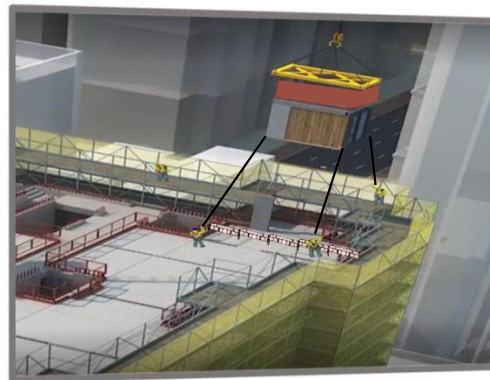
- Traffic Controller
- Designated loading/unloading area



Lifting Frame



Trial Lifting in
Protection



External Scaffold to provide safe working




The image features a dark blue circular shape on the left side, partially overlapping a white background. Below the blue circle is a smaller orange circle. To the right of these circles is a large, light gray circular area containing a pattern of thin, curved lines. The text "Gammon CDE" is written in white, bold, sans-serif font on the dark blue background.

Gammon CDE

GTwin / Tonkin St

gtwin.gammonconstruction.com/portal/apps/experiencebuilder/experience?data_id=dataSource_9-TDCCVT_0_5000%3A3&draft=true&id=b814a95fc6a540b0a073fb04cee8ef3a&page=page_0&views=view_3%2Cview_23

RSesri Patterns for BIM an...Frame - Immersive...esri Configure an Applic...Free Download - GI...



Integrated Digital Platform

GTwin

Smart Site Management System

to bring showers to the northern part of the South China Sea and the coast of Guangdong today and tom

ACE

IdPD

SAFETY PORTAL

MyGammon

金門易

Project Home Page

Design & Planning

Safety & Environment

Off-site Manuf. & Logistic

Quality & Resource Mgt

IoT Smart Sensors

G Eye - CCTV


BIM Model

GIS Map

Traffic View


















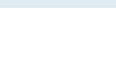




























































4D BIM

Return



Selected features:0

Mapwithyou, HK Government & HK GeoData Store, Esri, HERE, Garmin, Fo... Powered by Esri



Tangible Benefits:

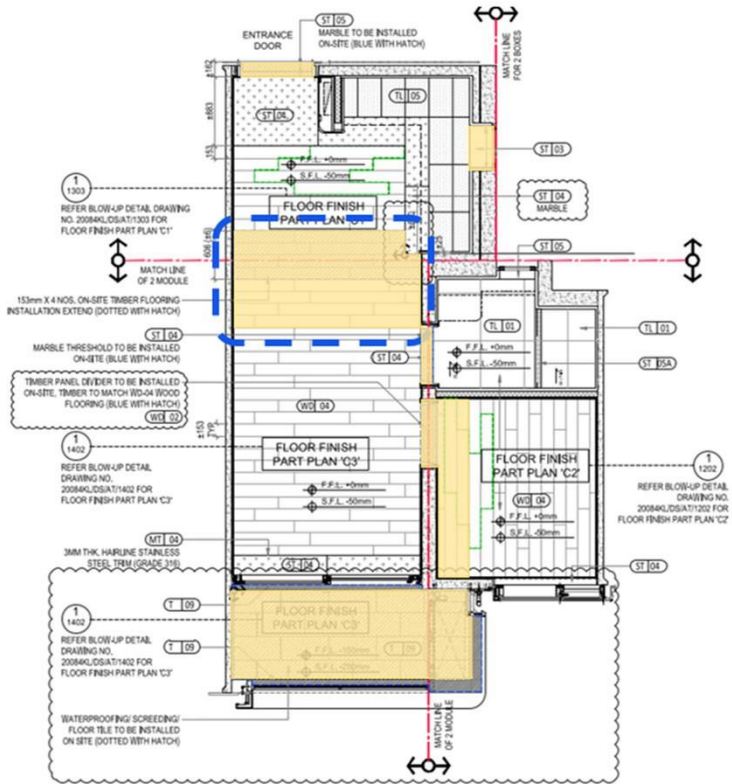
1. Connects the all team members to the Single Source of Truth
2. Reduces administration across the organisation by upwards of 20%
3. More accurate reporting
4. Reduces double handling of information by more than 50%
5. Attracts younger generations to the industry



Appendix A

Onsite/Offsite Demaraction

LIVING ROOM



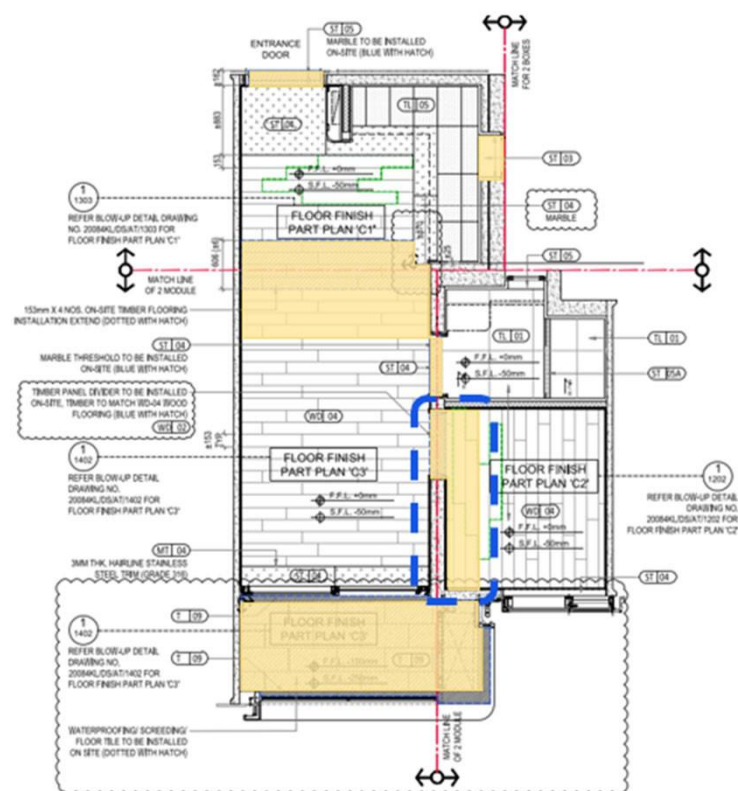
Prototype Left Out for MiC Joint



Prototype Completed Stitching



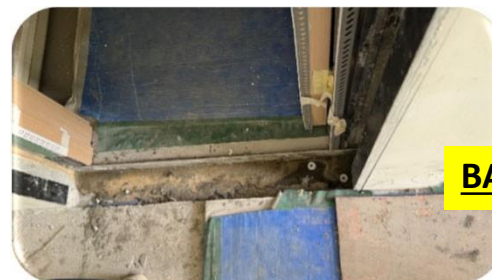
BATHROOM & BEDROOM DOOR



Prototype Left Out for MiC Joint



BEDROOM



BATHROOM

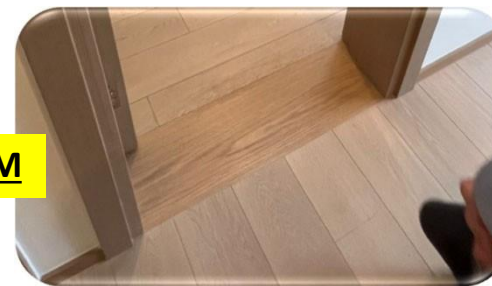


BATHROOM



BEDROOM

Prototype Completed Stitching

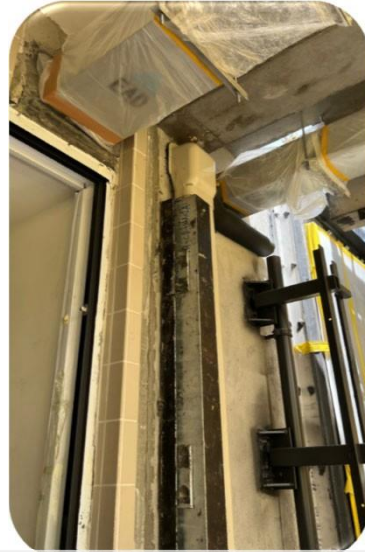
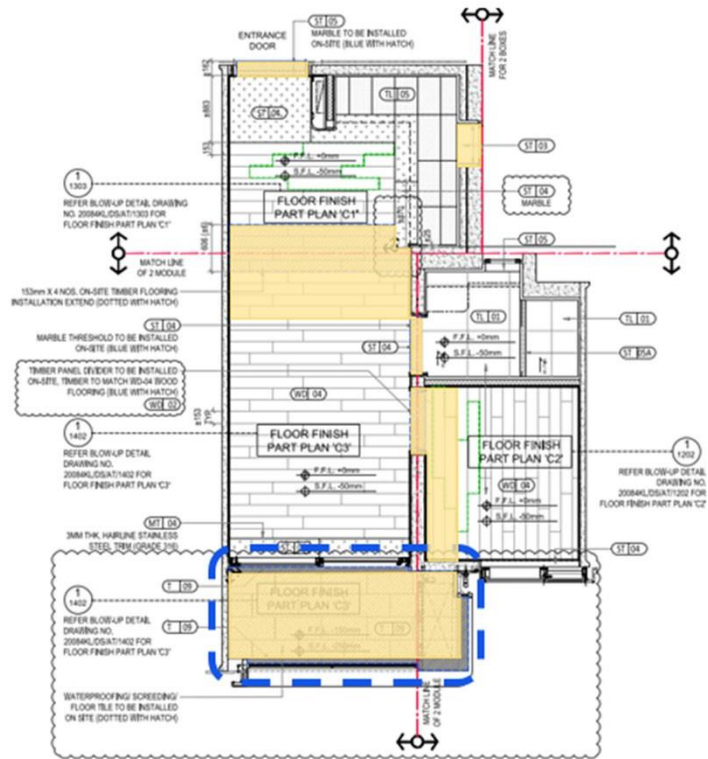


BATHROOM

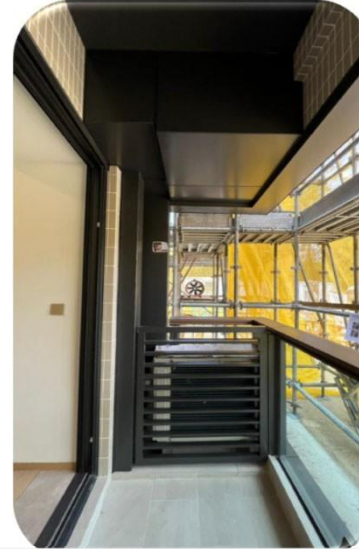


BEDROOM

BALCONY

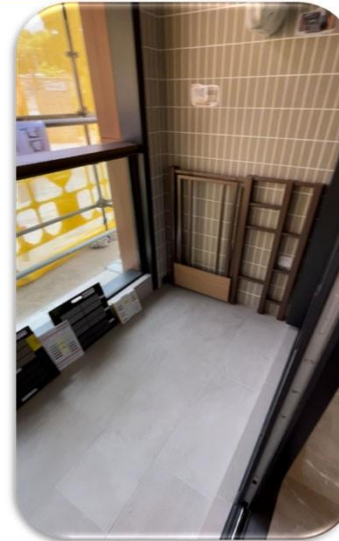


Prototype Left Out for MiC Joint

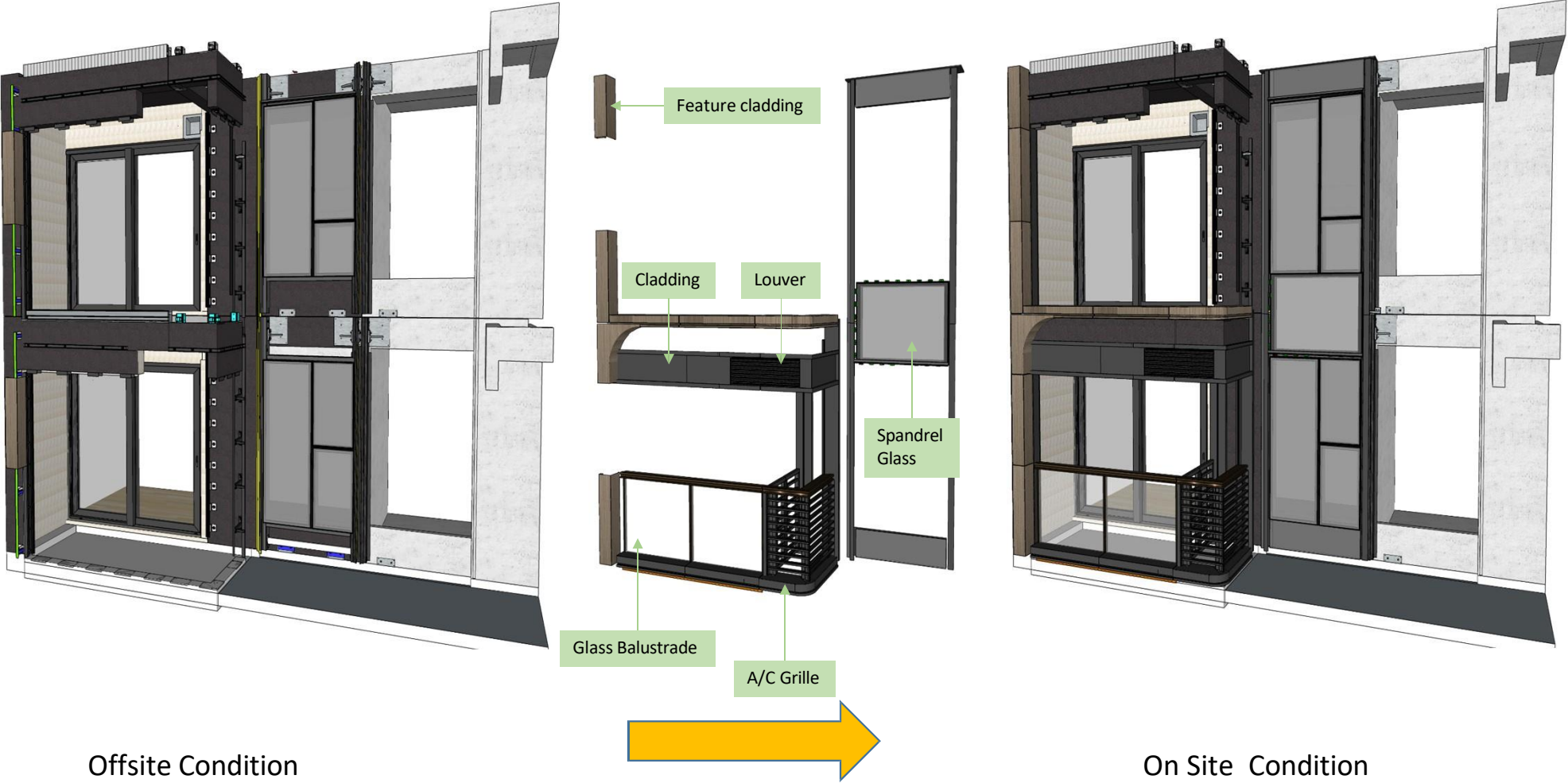



BALCONY

Prototype Completed Stitching



Facade



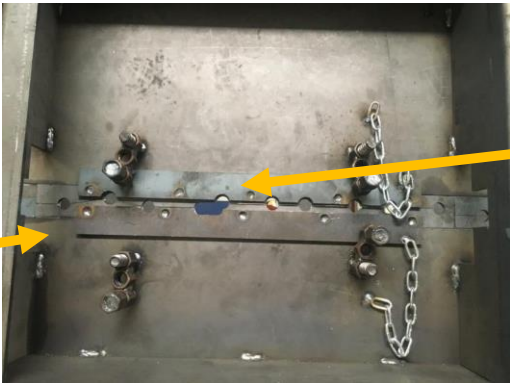


Appendix B

Factory QA Control

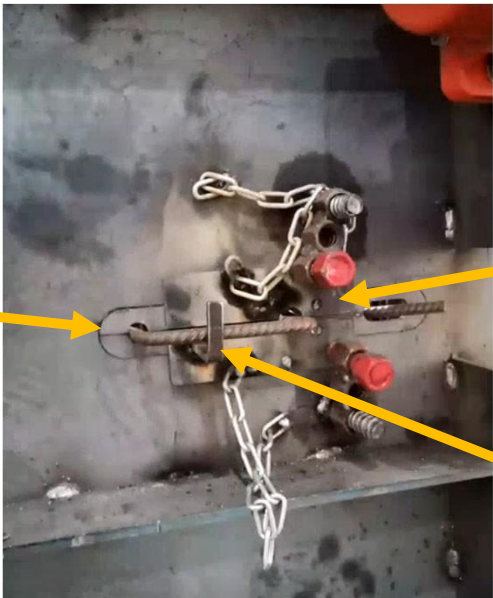
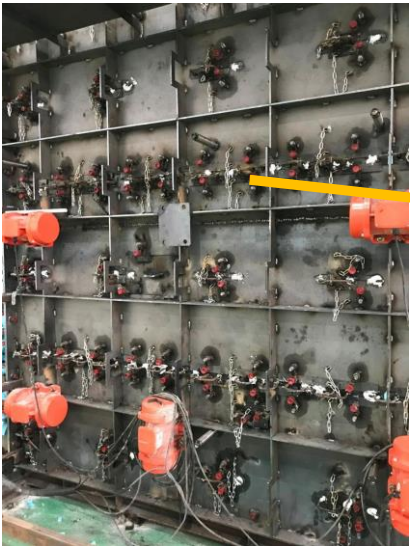
Accurate Positioning of Rebar at Composite Wall

1st batch of steel mould



Vertical limiter

2nd batch of steel mould

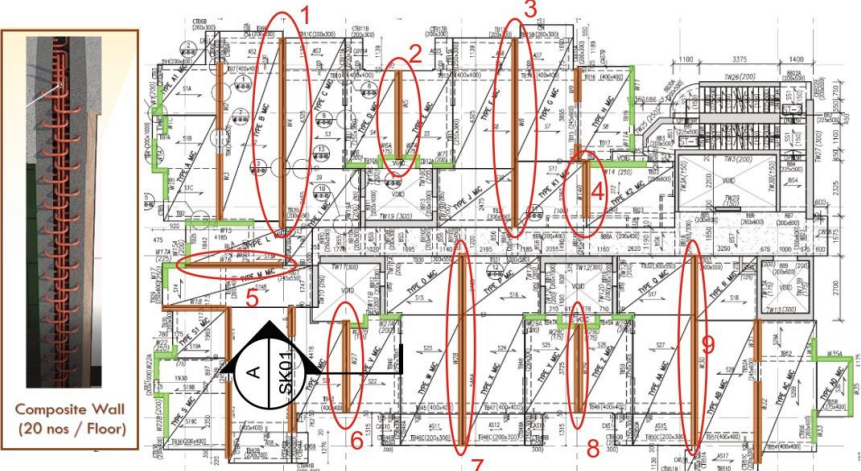


Vertical limiter

Horizontal limiter
(Newly added due to lesson learn)

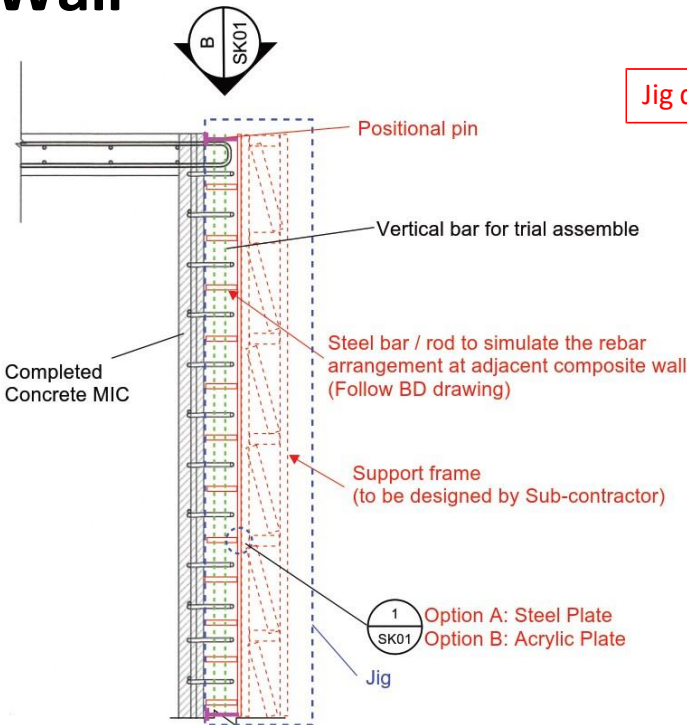
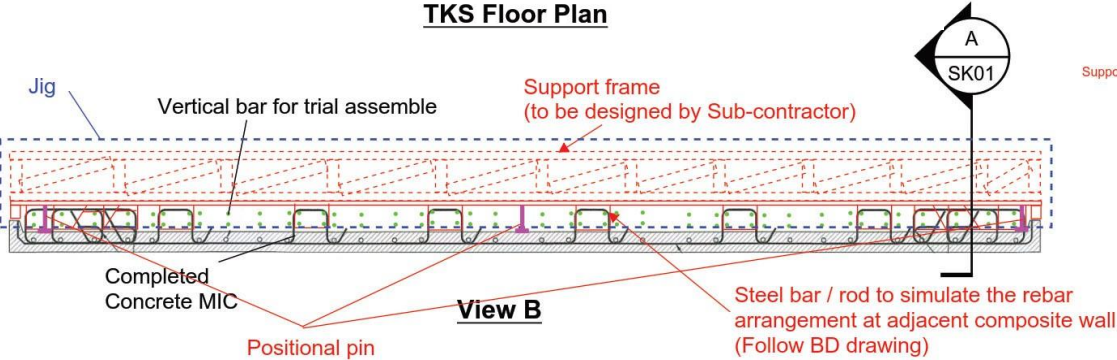
Positioning of Rebar Items at Composite Wall

Trial assemble for composite wall is critical issue,
Will use “Jig” (to simulate the rebar at other MiC) in mass production

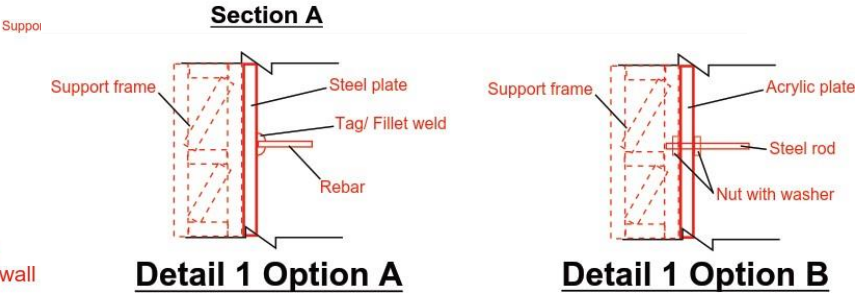


Total 9 nos. of composite wall require Jig (total 18 nos.) for trial assemble

TKS Floor Plan



Jig design intend





Thank You